

Attorney Docket: 313KA/50252
PATENT#9
88
6/16/03IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: SHIGEOKI KAYAMA ET AL.
Serial No.: 09/917,859 Group Art Unit: 3683
Filed: JULY 31, 2001 Examiner: Robert SICONOLFI
Title: DRIVE UNIT FOR WHEEL AND ASSEMBLY METHOD FOR THE
SAME

REPLY AFTER FINAL

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

The following remarks are respectfully submitted in response to the Office Action dated March 12, 2003.

Having carefully reviewed the Office Action, Applicants wish to clarify their arguments made in response to the previous Office Action.

Applicants want to make it clearer that one of the differences between the claimed invention and the prior art is that the claimed invention uses a clearance fit for the spline connection while the prior art uses an interference fit. In the claimed invention, the spline connection with the clearance fit prevents relative rotational movement between the hub and shaft but does not prevent relative axial movement. The relative axial movement between the hub and shaft is prevented by a connecting member such as a retaining ring.

In prior art automobiles, the spline connections use an interference fit as shown in Japanese Patent Publication 11-5404, which is attached herewith. Usually, the female splines on the hub are straight, while the male splines on the shaft are slightly tapered. To assemble the spline connection, the female splines are manually slid over the male splines, allowing a threaded end of the male splines to extend just outside of the female splines. At this point, the clearance between the male and female splines disappears, and the male and female

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splines can no longer be manually moved relative to each other. A jig is then used to screw a nut in the threaded end of the male splines to pull the male splines completely into the female splines, resulting in an interference fit. The interference fit prevents relative axial movement between the hub and shaft, while the splines prevent relative rotational movement.

In the present case, none of the cited references teach or suggest the use of a clearance fit between the male and female splines. Therefore, the pending claims are not anticipated by the cited references. Accordingly, reconsideration and withdrawal of the rejections of Claims 1-9 set forth in Paragraphs 4 and 5 of the Office Action are respectfully requested.

Another feature of the present invention, namely the claimed range of spline clearance angle, is also not taught or suggested by the cited references. The upper and lower limits of the clearance angle were invented based on the problem described on Page 13 of the specification. Specifically, if the clearance is too small, the assembly of the drive unit is made more difficult, which affects automobile productivity, resulting in long assembly time, reduced number of automobiles produced per hour, high costs, and reduced yields. High costs result in high prices for automobiles, which reduce automobile sales. On the other hand, large clearances result in noises and thus reduced driver comfort. If the clearance is within the claimed range, however, this critical problem can be solved.

Furthermore, Applicants respectfully submit that the rejections have been improperly made final. In response to the previous Office Action, Applicants stated that there is no disclosure in the cited references that the noise generated by the drive unit can be reduced by controlling spline clearance. Applicants pointed out that, in fact, there is no disclosure in the cited references that the noise generated by the drive unit is even related to spline clearance. Therefore, Applicants concluded that the claimed invention produces a result that was not expected in the prior art. The present Office Action, however, failed to respond to this argument. Applicants respectfully submit that this failure is a violation of PTO policies. MPEP 707.07(f) ("where the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, take note of the applicant's argument and answer the substance of it). Furthermore, because the present Office Action does not include a rebuttal of all of Applicants' arguments, Applicants respectfully request withdrawal of the finality of the rejections. MPEP 706.07 (a final rejection should include a rebuttal of any arguments raised in the applicant's reply).

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In light of the foregoing remarks, this application is considered to be in condition for allowance, and early passage of this case to issue is respectfully requested. If there are questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit Account No. 05-1323 (Docket #313KA/50252).

June 12, 2003

Respectfully submitted,



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